cell population, or a homogenous cell population prepared from a solid tissue, the method comprising:

a. coating paramagnetic particles with an antibody or antibody fragment reactive with an antigen membrane structure specifically expressed on the target cell and not on a non-target cell in the cell suspension;

b. contacting the coated paramagnetic particles with the cell suspension;

c. incubating and rotating the mixture of coated paramagnetic particles and cell suspension;

d. incubating the mixture of coated paramagnetic particles and cell suspension with an additional antibody or antibody fragment that is the same or different as that stated in (a), and binding the additional antibody or fragment to an antigen membrane structure specifically expressed on the target cell, that is the same or different as that stated in (a), and wherein the additional antibody or fragment is labeled;

e. separating particle-target cell complexes from unbound particles, unspecifically bound non-target cells and unbound non-target cells in the mixture of coated paramagnetic particles and cell suspension by transferring the mixture to a separating apparatus, the separating apparatus comprising a filter having a pore size and shape capable of retaining particle-target cell complexes or rosettes and

f. detecting labeled antibody/target cell/particle-immobilized antibody, labeled target cell/particle-immobilized antibody, or labeled antibody/target cell complexes and counting the complexes.

3. (Amended) The method of claim 1, wherein the incubating and rotating of the mixture, or the incubating of the mixture with the additional antibody or antibody fragment, or both, last for 5 minutes to 2 hours.

43. (Amended) A method for detecting a specific target cell in a cell suspension, the cell suspension comprising a mixed cell population, a fluid system containing a mixed cell population, or a homogenous cell population prepared from a solid tissue, the method comprising:

a. pre-coating paramagnetic particles with an antibody reactive with an Fc-portion of an antibody or an antibody fragment reactive with a membrane structure specifically expressed on the target cell and not on a non-target cell in the cell mixture;

b. incubating the cell suspension with an additional antibody or antibody fragment that binds to an extracellular or intracellular molecule present in the target cell, wherein the additional antibody or fragment is labeled;

c. contacting the precoated paramagnetic particles with the cell suspension to form a complex comprising the pre-coated paramagnetic particles, the antibody or antibody fragment reactive with a membrane structure specifically expressed on the target cell and not on a non-target cell in the cell mixture, and the target cell;

d. separating particle/antibody/target cell/additional antibody or antibody fragment complexes from unbound particles, unspecifically bound non-target cells and unbound non-target cells in the mixture of coated paramagnetic particles and cell suspension by transferring the mixture to a separating apparatus, the separating apparatus comprising a filter having a pore size and shape capable of retaining particle-target cell complexes or rosettes and

e. counting the particle/antibody/target cell/additional antibody or antibody fragment complexes.

45. (Amended) The method of claim 44, wherein incubating the mixture of coated paramagnetic particles and cell suspension lasts for 5 minutes to 2 hours.

50. (Amended) The method of claim 49, wherein incubating the mixture lasts for 5 minutes to 2 hours.

74. (Amended) The method of claim 43, wherein the growth factor receptor is an epidermal growth factor (EGF) receptor, a platelet derived growth factor (PDGF) A receptor, a PDGF B receptor, an insulin receptor, an insulin-like growth factor receptor, a transferrin receptor, a nerve growth factor (NGF) receptor, or a fibroblast growth factor (FGF) receptor.

86. (Amended) A kit for performing a method for detecting a specific target cell in a cell suspension, the cell suspension comprising a mixed cell population, a fluid system containing a mixed cell population, or a homogenous cell population prepared from a solid tissue, [without detection of normal and malignant hematopoietic cells,] the kit comprising:

a. a first antibody or antibody fragment reactive with a membrane structure specifically expressed on the target cell and not on a non-target cell in the cell mixture;

b. a second antibody or antibody fragment reactive with an Fc-portion of the first antibody, wherein the second antibody or fragment thereof is coated onto a paramagnetic particle;

c. the paramagnetic particle; and

d. a third antibody or antibody fragment, that is the same or different as that stated in (a), reactive with an antigen or membrane structure that is the same or different as that stated in (a) or a receptor within or on the target cell; wherein said antibody or antibody fragment is conjugated to biotin, an enzyme, or a non-paramagnetic particle with a specific color or with a bound enzyme;

e. an apparatus for separating particle-target cell complexes from unbound particles, unspecifically bound non-target cells and unbound non-target cells in a cell

suspension of mixed cell populations, the apparatus comprising a filtrate collection box, a lid, a plurality of multiwell units, a cell separator membrane filter having a pore size and shape capable of retaining particle-target cell complexes or rosettes and which filter provides a matrix for cell growth, and a filter support; the filter and filter support are detachably fixed to the bottom of the multiwell unit; and

f. a paramagnetic or non-paramagnetic particle precoated with a specific target cell antigen or group of antigens for use as a control or standard.

Please add new claims 89-91 as follows:

89. (New) A method for detecting a specific target cell in a cell suspension, the cell suspension comprising a mixed cell population, a fluid system containing a mixed cell population, or a homogenous cell population prepared from a solid tissue, the method comprising:

a. coating paramagnetic particles with an antibody or antibody fragment reactive with an antigen membrane structure specifically expressed on the target cell and not on a non-target cell in the cell suspension;

b. contacting the coated paramagnetic particles with the cell suspension;

c. incubating and rotating the mixture of coated paramagnetic particles and cell suspension;

d. incubating the mixture of coated paramagnetic particles and cell suspension with an additional antibody or antibody fragment that is the same or different as that stated in (a), and binding the additional antibody or fragment to an antigen membrane structure specifically expressed on the target cell, that is the same or different as that stated in (a), and wherein the additional antibody or fragment is labeled;

e. separating particle-target cell complexes from unbound particles, unspecifically bound non-target cells and unbound non-target cells in the mixture of coated paramagnetic particles and cell suspension by transferring the mixture to a separating apparatus, the separating apparatus comprising a filter having a pore size and shape capable of retaining particle-target cell complexes or rosettes, a filtrate collection box, a lid, a plurality of multiwell units, and a filter support, wherein the filter and filter support are detachably fixed to the bottom of the multiwell unit, and wherein the filter is fabricated from a nylon monofilament membrane containing pores having a regular and consistent shape and size; and

f. detecting labeled antibody/target cell/particle-immobilized antibody, labeled target cell/particle-immobilized antibody, or labeled antibody/target cell complexes and counting the complexes.

90. (New) The method of claim 89, wherein the size and shape of the pores is sufficient to retain particle-target cell complexes, while allowing unbound particles, unspecifically bound non-target cells, and unbound non-target cells to pass through the filter.

91. (New) The method of claim 89, wherein the pores have a size of 20 μm.